

Confirmation No. 3541

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	SCHETTERS	Examiner:	Behm, H.
Serial No.:	10/575,771	Group Art Unit:	2838
Filed:	April 12, 2006	Docket No.:	NL031227US (NXPS.537PA)
Title:	POWER CONVERTER WITH A SINGLE DIODE RECTIFIER AND A FILTER		

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APPEAL BRIEF

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Commissioner For Patents  
P.O. Box 1450  
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Customer No. <b>65913</b>
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Dear Sir:

This Appeal Brief is submitted pursuant to 37 C.F.R. §41.37, in support of the Notice of Appeal filed March 18, 2010 and in response to the rejections of claims 1-2 and 7-11 as set forth in the Final Office Action dated November 19, 2009.

**Please charge Deposit Account No. 50-4019 (NL031227US) \$540.00** for filing this brief in support of an appeal as set forth in 37 C.F.R. §1.17(c). If necessary, authority is given to charge/credit Deposit Account 50-4019 additional fees/overages in support of this filing.

**I. Real Party In Interest**

The real party in interest is NXP Semiconductors. The application is presently assigned of record, at reel/frame nos. 019719/0843 to NXP, B.V., headquartered in Eindhoven, the Netherlands.

**II. Related Appeals and Interferences**

While Appellant is aware of other pending applications owned by the above-identified Assignee, Appellant is unaware of any related appeals, interferences or judicial proceedings that would have a bearing on the Board's decision in the instant appeal.

**III. Status of Claims**

Claims 1-2 and 7-11 stand rejected and are presented for appeal. Claims 3-5 are objected to as being dependent upon a rejected base claim but are noted as being allowable if rewritten. Claims 6 and 12-15 are allowed. A complete listing of the claims under appeal is provided in an Appendix to this Brief.

**IV. Status of Amendments**

No amendments have been filed subsequent to the Final Office Action dated November 19, 2009.

**V. Summary of Claimed Subject Matter**

As required by 37 C.F.R. § 41.37(c)(1)(v), a concise explanation of the subject matter defined in the independent claims involved in the appeal is provided herein. Appellant notes that representative subject matter is identified for these claims; however, the abundance of supporting subject matter in the application prohibits identifying all textual and diagrammatic references to each claimed recitation. Appellant thus submits that other application subject matter, which supports the claims but is not specifically identified above, may be found elsewhere in the application. Appellant further notes that this summary does not provide an exhaustive or exclusive view of the present subject matter, and Appellant refers to the appended claims and their legal equivalents for a complete statement of the invention.

Commensurate with independent claim 1, an example embodiment of the present invention is directed to a power converter, comprising: an input circuit having a rectifier (*e.g.*, Fig. 1; p. 2, 2:2-28) configured for receiving a full-wave AC signal (*e.g.*, Fig. 1, Vmains; p. 2:5-6) along a first conductive path and a second conductive path, the rectifier including a single diode rectifier (*e.g.*, Fig. 1, D; p. 2, 2:5-6) and a filter that includes a non-electrolytic capacitor (*e.g.*, Fig. 1, Cdiff; p. 2, 2:2-28) connected in series with the rectifier and across the first and second conductive paths, that includes a conductive impedance element (*e.g.*, Fig. 1, Ldiff; p. 2:2-28) connected in series with the non-electrolytic capacitor and arranged to extend the second conductive path to common, the filter providing a DC voltage output (*e.g.*, Fig. 1, VDC; p. 2, 2:2-28); and a switched mode power supply IC (*e.g.*, Fig. 1, SMPS; p. 2, 2:2-28) arranged to receive the DC voltage output from the filter.

#### **VI. Grounds of Rejection to be Reviewed Upon Appeal**

The grounds of rejection to be reviewed on appeal are as follows:

- A. Claims 1 and 2 stand rejected under 35 U.S.C. § 103(a) over Balakrishnan (U.S. Patent No. 6,813,168) in view of Saleh (U.S. Patent No 4,353,114).
- B. Claim 7 stands rejected under 35 U.S.C. § 103(a) over the '168 and '114 references and further in view of Balakrishnan (U.S. Patent 6,525,514).
- C. Claims 8-11 stand rejected under 35 U.S.C. § 103(a) over the '168 and '114 references and further in view of the TEA152x family data sheet by Phillips.

#### **VII. Argument**

To assist in the Board's review, Appellant provides a general overview before addressing specific deficiencies of the rejections. As a general matter, Appellant notes that the Examiner's core arguments rely upon general assumptions and assertions that are insufficient to support a legal conclusion of obviousness. Almost all electronic circuits are constructed from known elements that, in some sense, perform according to their known functional properties. Even so, a significant number of patents have issued, have had their validity confirmed by litigation and continue to issue despite being combinations of such known elements. Thus, it is of particular importance that the specific arrangement of the elements be carefully considered as part of an analysis of patentability. General averments

and generic conclusions, when coupled with a failure to consider differences between teachings of references, cannot be used as the primary rationale behind a rejection of patentability.

The particular embodiments of Appellant's invention relate to rectifier circuits and filtering for use with a switched-mode power supply integrated circuit. Specific embodiments relate to a filter circuit specially designed for use with a single diode rectifier circuit. This filter circuit includes a particular arrangement of an electrolytic capacitor and a conductive impedance element. The specific parameters regarding the type of capacitor (*e.g.*, internal resistance and total capacitance) in combination with other filter element(s) provide a stable supply voltage with a low component count.

The cited references relate to several different filter circuits tailored toward different applications. None of the cited references has been shown to correspond to the claim limitations. None of the teachings suggest combining the references and instead suggest selecting one implementation over the other. While an artisan might address the specific needs served by a particular solution from one of the references, improper hindsight is used to support the Examiner's conclusion that a skilled artisan would pick from aspects of these carefully designed solutions, without any further advantage, and experiment to realize Appellant's invention. The references themselves provide express evidence of teaching away from such modifications. These and other failings of the rejections are discussed in more detail hereafter.

**A. The Rejections Of Claims 1-2 And 7-11 Under 35 U.S.C. § 103(A) Are Improper For Lack Of Correspondence And For Failing To Present A Clearly Articulated Reason For The Conclusion Of Obviousness.**

Each of the rejections of claims 1-2 and 7-11 rely upon the same underlying alleged combination of the teachings of the primary '168 reference with the teachings of the secondary '114 reference. None of the additional reference cures the deficiencies of this underlying alleged combination. Accordingly, Appellant has grouped each of these claims to facilitate the Board's review.

It is improper to modify the primary '168 reference based upon a generic conclusion unsupported by specific teachings. Thus, the Examiner's unsupported conclusion regarding general aspects of pi filters and capacitors does not address the specifics of the asserted

modification. The Examiner appears to have reached a conclusion independent of the actual suggestions and teachings of the references. Neither reference teaches nor suggests that the filter of the secondary '114 reference is desirable for use in the substantially different circuit of the primary '168 reference (as is readily apparent from the cited secondary '114 reference's Fig. 1A and primary '168 reference's Fig. 6). According to M.P.E.P. § 2141, where evidence of motivation has not been provided, a rejection can be rebutted simply by showing that "the elements in combination do not merely perform the function that each element performs separately." The two references are directed toward different applications and have specific circuits designed for these different applications. For instance, the circuit of the secondary '114 reference is not designed for use with an AC current rectification of the primary '168 reference. As shown in FIG. 1A, the circuit is a DC/DC conversion circuit using a Zener diode (CR52) to convert an input DC signal to a level determined by the Zener diode. Moreover, the circuit of FIG. 1A appears to be designed for use with a saturable reactor (L1). A saturable reactor is a special form of inductor where the magnetic core can be deliberately saturated by means of a DC current flowing in a control winding. The primary '168 reference, however, is directed towards an AC current source and does not appear to use a saturable reactor. Thus, the elements do not simply perform the function that each element performed separately, and there is no evidence that the skilled artisan would find it obvious to use a DC/DC conversion circuit/filter as a replacement for circuit used in connection with an AC rectifier circuit.

Further, the references provide no indication that the filter of the secondary '114 reference would result in the alleged benefits in the primary '168 reference of assuring "a relatively steady DC output voltage at DC output as required for efficient operation of a power conversion circuit that is to be coupled to receive the DC output voltage at DC output". There is no teaching or suggestion that the filter of the secondary '114 reference is capable of providing this benefit when a half wave rectifier is used for AC/DC conversion (*e.g.*, Fig. 4B of the primary '168 reference) or that it would be viewed as being obvious to modify given that the existing circuit was specifically designed for the particular application.

It is also improper to propose modifying the primary '168 reference (Fig. 6) to include the non-electrolytic capacitor C41 and conductive impedance element L1 of the

secondary '114 reference. The record contains little more than an identification of circuit elements (such as non-electrolytic capacitors, which can be found in any number of references) and their use in a particular circuit/application not found in the primary '168 reference. The unsupported conclusion, regarding the arrangement of these the identified elements, appears to have used the Appellant's disclosure as a template. This is the hallmark of improper hindsight reconstruction with the proposed combination being derived, not "on the basis of the facts gleaned from the prior art," but solely from Appellant's disclosure. *See, e.g.,* M.P.E.P. §2142. As stated above, there is no teaching or suggestion that the non-electrolytic capacitor is desirable for smoothing or filtering a "half wave rectified" input as to provide "a relatively steady DC output voltage at DC output." Further, the '114 reference does not teach that a non-electrolytic capacitor is desirable for smoothing or filtering when separated from other smoothing components disclosed in the filter of the '114 reference, such as electrolytic capacitor C42 and Zener diode CR52 (Fig. 1A.) As such, there is no evidence of record that provides any reason why the skilled artisan would modify Fig. 6 of the '168 reference to include a non-electrolytic capacitor in series with a conductive inductive element, extending the path to common, and following a half wave rectifier.

Moreover, the '168 reference teaches away from the use of the filter of the '114 reference. Consistent with the recent Supreme Court decision, M.P.E.P. § 2143.01 explains the long-standing principle that a § 103 rejection cannot be maintained when the asserted modification undermines either the operation or the purpose of the main ('168) reference - the rationale being that the prior art teaches away from such a modification. *See KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1742 (2007) ("[W]hen the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be non-obvious.").

The primary '168 reference teaches away from the use of the filter of the secondary '114 reference as it would defeat the benefit of "reduc[ing] the cost and complexity of input EMI filter circuitry...." Particularly, the primary '168 reference teaches that it is desirable to use a single larger bulk capacitor for smoothing and filtering as "the elimination of one bulk storage capacitor typically provides a significant cost savings over the configuration [with several smaller capacitors] since the cost of each capacitor component is strongly influenced

by the packaging itself which is reduced using a single component.” Because the filter of the secondary ‘114 reference includes four filtering capacitors (Fig. 1A C41, C42, C45, C46), there is no evidence of record that provides any reason why the skilled artisan would modify Fig. 6 of the primary ‘168 reference to include the filter disclosed in the secondary ‘114 reference. Under M.P.E.P. § 2143.01, the rejections cannot be maintained.

For each of the aforementioned reasons, the § 103 rejections should be reversed.

**B. The Rejections Of Claims 1-2 And 7-11 Under 35 U.S.C. § 103(A) Are Improper For Lack Of Correspondence And For Failing To Present A Clearly Articulated Reason For The Conclusion Of Obviousness.**

The Examiner has proposed to modify Fig. 6 of the primary ‘168 reference to include the capacitor (Fig. 1a, C41) shown in the secondary ‘114 reference in series with conductive impedance element (Fig. 1a, L1) of the primary ‘168 reference, following rectifier circuit 600 of the primary ‘168 reference. Despite requesting clarification it remains unclear in what manner the Examiner has proposed to perform the stated modification (*e.g.* whether elements C41 and L1 of the secondary ‘114 reference allegedly would be incorporated into the filter (Fig. 6 602-604) of the primary ‘168 reference, or whether the skilled artisan would replace the filter (Fig. 6 602-604) of the primary ‘168 reference with the entire filter (Fig. 1A CR52, C41 C42, L1, C45, C46) disclosed in the secondary ‘114 reference). Without such clarification, an analysis as to possible correspondence is premature.

Notwithstanding, Appellant submits that the proposed modification of the primary ‘168 reference by the filter circuit disclosed in the secondary ‘114 reference would not correspond because no workable solution is evident from the teachings of the references. Neither reference teaches nor suggests that the filter of the secondary ‘114 reference is desirable for use in the substantially different circuit of the ‘168 reference (as is readily apparent from the cited ‘114 Fig. 1A and ‘168 Fig. 6). The circuit of the secondary ‘114 reference is not designed for AC current rectification of the primary ‘168 reference. As shown in FIG. 1A, the circuit of the secondary ‘114 reference is a DC/DC conversion circuit using a Zener diode (CR52) to convert an input DC signal to a level determined by the Zener diode. Moreover, the circuit of FIG. 1A appears to be designed for use with a saturable

reactor (L1). A saturable reactor is a special form of inductor where the magnetic core can be deliberately saturated by means of a DC current flowing in a control winding. It is unclear how or why these aspects would be implemented in connection with the primary '168 reference, which is directed towards a rectifier for an AC current source.

For at least these reasons, the proposed modification does not correspond to each limitation and the § 103 rejections should be reversed.

### **VIII. Conclusion**

In view of the above, Appellant submits that the rejections of claims 1-2 and 7-11 are improper and therefore requests reversal of the rejections as applied to the appealed claims and allowance of the entire application.

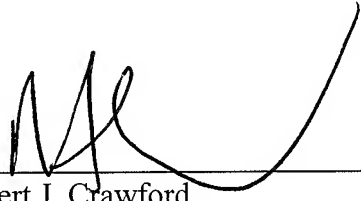
Authority to charge the undersigned's deposit account was provided on the first page of this brief.

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**APPENDIX OF CLAIMS INVOLVED IN THE APPEAL**  
(S/N 10/575,771)

1. A power converter, comprising:  
an input circuit having  
a rectifier configured for receiving a full-wave AC signal along a first  
conductive path and a second conductive path, the rectifier including  
a single diode rectifier and  
a filter that includes a non-electrolytic capacitor connected in series with the  
rectifier and across the first and second conductive paths, that includes a conductive  
impedance element connected in series with the non-electrolytic capacitor and arranged to  
extend the second conductive path to common, the filter providing a DC voltage output; and  
a switched mode power supply IC arranged to receive the DC voltage output from the  
filter.
2. A power converter as claimed in claim 1, wherein the non-electrolytic capacitor has a  
capacitance of about 100 nF.
7. A power converter as claimed in claim 1, wherein the DC voltage output of the filter  
is applied to a series connection of a primary winding, the switched mode power supply IC,  
and a resistor.
8. A power converter as claimed in claim 1, wherein the switched mode power supply  
IC includes a high gain feedback loop.
9. A power converter as claimed in claim 8, wherein the high gain feedback loop  
includes a multiplier arranged to diminish ripple caused by the non-electrolytic capacitor.
10. A power converter as claimed in claim 9, wherein the multiplier is a factor 10  
multiplier.

11. A power converter as claimed in claim 1, wherein the switched mode power supply IC includes an internal start-up circuit having a high-voltage start-up current source and without provision of any dissipative bleeder resistor.

## **APPENDIX OF EVIDENCE**

Appellant is unaware of any evidence submitted in this application pursuant to 37 C.F.R. §§ 1.130, 1.131, and 1.132.

## **APPENDIX OF RELATED PROCEEDINGS**

As stated in Section II above, Appellant is unaware of any related appeals, interferences or judicial proceedings.